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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/679,611

Filing Date: October 06, 2003

Appellant(s): YADAV ET AL.

Martin J. Cosenza
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed May 28, 2008 appealing from the Office action
mailed August 7, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,944,985	Alexander et al.	7-1990
4,292,029	Craig et al.	9-1981
5,718,047	Nakayama et al.	2-1998

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 32, 33, 38 and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,944,985 to Alexander et al.

Regarding applicant claims 32 and 33, Alexander et al. disclose ultra-fine particles having a size in the range of 5 to 500 nm (column 1, lines 10-12) which may comprise crystalline or amorphous materials as well as metals (such as copper), ceramics as well as their composites (column 1, lines 16-17; and column 6, lines 21-40). Alexander et al. also specifies particle sizes less than 100 nm (column 15, line 44) and 200 nm (column 13, lines 24-25).

Regarding applicant claims 38 and 40, Alexander et al. also disclose that the ultra-fine particles may be used to manufacture products such as conductive paints, pastes or inks (column 13, lines 41-47).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 39 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,944,985 to Alexander et al., as set forth in the section, above.

Alexander et al., as set forth in section, above disclose that the ultra-fine particles may be used to manufacture products such as conductive paints, pastes or inks, they do not specifically disclose, as per applicant claims 39 and 41, the formation of a print using these products.

Nonetheless, it is known in the printing arts that inks, for example, are suitable in the formation of printed matter and one skilled in the art would have utilized the ink product of Alexander et al., by known printing methods and with no change to their respective functions and/or operations, thus yielding the predictable result of a printed article.

Claims 17-31 and 34-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,944,985 to Alexander et al. in view of U.S. Patent No. 4,292,029 to Craig et al. or U.S. patent No. 5,718,047 to Nakayama et al.

Regarding applicant claims 17 and 24, Alexander et al. disclose ultra-fine particles having a size in the range of 5 to 500 nm (column 1, lines 10-12) which may comprise crystalline or amorphous materials as well as metals (such as copper), ceramics as well as their composites (column 1, lines 16-17; and column 6, lines 21-40). Alexander et al. also disclose that the ultra-fine particles may be used in conductive paints, pastes or inks (column 13, lines 41-47).

Although Alexander et al. disclose that the ultra-fine particles are substantially spherical in shape (column 6, lines 35-40), they do not specifically disclose, as per applicant claims 17 and 24 that the particles have an aspect ration of greater than 1.

Nonetheless, it would have been obvious to one of ordinary skill in the art at the time of invention to have provided the ultra-fine particles of Alexander et al. with aspect ratios greater than 1 motivated by the fact that Craig et al. and/or Nakayama et al., both also drawn to coating products, disclose that such products may utilize inorganic, metallic or composite filler particles having a size of between 5 and 500 nm (Craig et al., column 6, lines 42-52) in the form of fibers,

whiskers or plates, or spheres – forms which would have aspect ratios of greater than 1 (Craig et al. at column 6, lines 32-52; Nakayama et al. at column 5, lines 58-65).

Regarding applicant claims 18-20 and 25-27, both Craig et al. and/or Nakayama et al. disclose utilize inorganic, metallic or composite filler particles (nano-particles in the case of Craig et al.) having a size of between 5 and 500 nm (Craig et al., column 6, lines 42-52) in the form of fibers, whiskers or plates, or spheres – forms which would have aspect ratios of greater than 1 (Craig et al. at column 6, lines 32-52; Nakayama et al. at column 5, lines 58-65).

Regarding applicant claims 21, 22, 28 and 30, Alexander et al. disclose that the ultra-fine particles may be used in conductive paints, pastes or inks (column 13, lines 41-47).

Regarding applicant claims 23, 30 and 31, Alexander et al. also disclose that the ultra-fine particles may comprise crystalline or amorphous materials as well as metals, ceramics and their composites (column 1, lines 16-17). Alexander et al. disclose that suitable materials include: silica carbon, alumina, tin oxide, zirconia, metal powders such as molybdenum, tungsten, copper, nickel, iron, cobalt and alloys of these metals or these with other metals water insoluble metal silicates (e.g., zinc silicate, lead silicate, aluminum silicate, calcium aluminum silicate, magnesium aluminum silicate, zirconium silicate, sodium aluminum silicate, potassium aluminum silicate and rare earth metal silicates), metal oxides, complex oxides or other material which may or may not be inert and which can be processed into ultra-fine particles (column 6, lines 21-36).

Regarding applicant claims 34-37, Alexander et al., as set forth, above, disclose that the ultra-fine particles may be used, as per applicant claims 34 and 36, to manufacture products such as conductive paints, pastes or inks, they do not specifically disclose, as per applicant claims 35 and 37, the formation of a print using these products.

Nonetheless, it is known in the printing arts that inks, for example, are suitable in the formation of printed matter and one skilled in the art could have utilized the ink product of Alexander et al., by known printing methods and with no change to their respective functions and/or operations, thus yielding the predictable result of a printed article.

(10) Response to Argument

I. Appellant's arguments regarding the rejection of claims 32, 33, 38 and 40 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,944,985 to Alexander et al.

The Appellant's main argument with regards to the above rejection is that Alexander's disclosure of particle size is insufficient to support an anticipation rejection and "Alexander merely teaches, at most, overlapping ranges." (Appeal Brief of 5/13/2008 at page 8, 4th full paragraph). Secondly, the Appellant argues that even though Alexander et al. teach copper as a suitable material for the particles, copper is disclosed as one of a large number of species of metals. The Appellants concludes that since Alexander et al. "fails to explicitly or inherently (i.e., each and every time) teach the invention exactly as claimed," they contain no teaching that anticipates any claim now pending. (Appeal Brief of 5/13/2008 at page 10, 4th full paragraph).

In response, the Examiner respectfully agrees with the Appellant that if the rejection of claims 32, 33, 38 and 40 were not anticipated by Alexander et al., they would indeed overlap the claimed ranges, thus rendering the claims *prima facie* obvious over Alexander et al. (See MPEP 2144.05). The Examiner respectfully submits, however, that this conclusion is not necessary as the above claims actually are anticipated by the disclosure of Alexander et al.

The instant claims require a printable formulation comprising copper particles having a domain size of less than 250 nm, more preferably, less than 100 nm. As set forth in the non-final officer action mailed August 7, 2008, Alexander disclose a printable formulation (column 13, lines 41-47) which may comprise metallic particles having a size in the range of 5 to 500 nm (column 1, lines 10-12). More particularly, Alexander et al. disclose a printable formulation comprising copper particles with a size of less than 100 nm (column 13, lines 1-15). Therefore,

the Examiner respectfully submits that the formulation of Alexander et al. properly anticipates Appellant claims 32, 33, 38 and 40 and should be affirmed.

II. Appellant's arguments regarding the rejection of claims 39 and 41 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,944,985 to Alexander et al.

The Appellant's main argument against the above rejection is that it is (Appeal Brief of 5/13/2008 at page 11, 1st full paragraph):

predicated upon the assertion that (i) claims 32 and 33 are anticipated by Alexander, that (ii) Alexander teaches that his products may be used to manufacture inks, etc., and that (iii) it is "known in the printing arts that inks, for example, are suitable in the formation of printed matter."

The Appellant then concludes that since Alexander et al. does not anticipate claims 32 and 33, any obviousness rejection based upon that assertion is invalid and claims 39 and 41 cannot be rejected as obvious over Alexander et al. as well. The Examiner respectfully disagrees.

As set forth above, the Examiner has shown that claims 32 and 33 are properly rejected in anticipation of the Alexander et al. reference. The Appellant has based his conclusion of non-obviousness only on the position that Alexander et al. does not anticipate claims 32 and 33. Since this position has been shown to be untenable, the Examiner respectfully submits that the rejection of claims 39 and 41 as obvious in view of Alexander et al. is proper and should be affirmed.

III. Appellant's arguments regarding the rejection of claims 17-31 and 34-37 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,944,985 to Alexander et al. in view of U.S. patent No. 4,292,029 to Craig et al. or U.S. Patent No. 5,718,047 to Nakayama et al.

The Appellant's correctly point out that the above claims require particles (metallic and ceramic) which have a size of less than 100 nm and an aspect ration of greater than 1 (Appeal Brief of 5/13/2008 at page 11, 2nd full paragraph). The Appellant's then argue that the deficiencies of Alexander et al. (who do disclose metallic and ceramic particles with a size of less than 100nm but whose particles are substantially spherical, and this have an aspect ratio equal to 1) are not cured by either the Craig et al. or Nakayama et al. references because the Alexander et al. teaches away from non-spherical particles. The Appellant arrives at this conclusion based upon a single teaching of Alexander that inks require discrete, constant sized and substantially spherical particles. The Appellant also argues that the motivation to combine is conclusory. The Examiner respectfully disagrees.

Per MPEP 2145, a known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use. The preference of Alexander et al. for substantially spherical particles is just that, a preference. The Examiner therefore respectfully submits that Alexander et al. do not teach away from particles having an aspect ratio greater than 1.

With regards to the Appellant's argument that the motivation to combine the Alexander et al. and Craig et al. or Nakayama et al. references is merely conclusory, the Examiner respectfully submits that proper motivation was utilized. Although KSR forecloses the argument

that a specific teaching, suggestion or motivation is required to support a finding of obviousness, the reasoned explanation in support of the combination is repeated below (Non-final office action mailed August 7, 2007):

Although Alexander et al. disclose that the ultra-fine particles are substantially spherical in shape (column 6, lines 35-40), they do not specifically disclose, as per applicant claims 17 and 24 that the particles have an aspect ration of greater than 1.

Nonetheless, it would have been obvious to one of ordinary skill in the art at the time of invention to have provided the ultra-fine particles of Alexander et al. with aspect ratios greater than 1 motivated by the fact that Craig et al. and/or Nakayama et al., both also drawn to coating products, disclose that such products may utilize inorganic, metallic or composite filler particles having a size of between 5 and 500 nm (Craig et al., column 6, lines 42-52) in the form of fibers, whiskers or plates, or spheres – forms which would have aspect ratios of greater than 1 (Craig et al. at column 6, lines 32-52; Nakayama et al. at column 5, lines 58-65).

Given the reasoned explanation above, the Examiner respectfully submits that the combination in proper and the rejection of claims 17-31 and 34-37 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,944,985 to Alexander et al. in view of U.S. patent No. 4,292,029 to Craig et al. or U.S. Patent No. 5,718,047 to Nakayama et al. should be affirmed.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/JA Lorengo/

Conferees:

/Christopher A. Fiorilla/

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Roy King